IAC Mission Success Stories

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Advanced Materials & Processes Technology IAC (AMPTIAC)

AMPTIAC Story 1 Story 2

AMPTIAC Supports Navy MEMS Development Project

AMPTIAC personnel have been asked to provide materials characterization, analysis, and process optimization support to the Navy's MEMS (MicroElectroMechanical system) technology-based fuze/safety and arming (F/S&A) device development program. Engineers at the Indian Head Division, Naval Surface Warfare Center in Indian Head, MD, are applying MEMS technology to the miniaturization of F/S&A systems for deployment in the Navy's next-generation defensive torpedo weapon system. These small torpedoes (6.25 inches diameter) will be launched from ships and submarines to defeat incoming enemy torpedoes.

Continued on Story 1

AMPTIAC Conducts Workshops to help DoD Focus Research Efforts in Computational Materials Science and Blast & Penetration Resistant Materials

AMPTIAC was recently asked to review the state-of-the-art in the fields of Computational Materials Science (CMS) and Blast & Penetration Resistant Materials (BPRM.) As part of this task, two one-and-a-half-day workshops were organized to bring invited researchers and practitioners in each of these fields together. The workshops assisted Dr. Lewis Sloter, Staff Specialist for Materials and Structures at the Office of the Deputy Under Secretary of Defense-Science and Technology/Weapons Systems, in generating a comprehensive picture of current efforts, where these technologies are strongest, and how the defense establishment might guide and benefit from further advancements. The workshop also served to foster collaboration, review the state of the art, and define areas of strategic interest to DoD.

Continued on Story 2

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AMPTIAC Supports Navy MEMS Development Project (continued)

AMPTIAC's engineers are providing assistance in the design of materials analysis and test structures, as well as testing of these specimens and subsequent analysis of resultant data. Additionally, fabricated parts are studied for ways of optimizing the processing procedures to increase device yield and functionality. Research is also conducted into legacy integrated circuit technology for benefits from coatings, passivation of surfaces, and packaging techniques. This research aids the Navy's engineers by relieving some of the burdens of research, allowing more resources for applied engineering and problem solving. Materials studied include thick electroplated nickel, single crystal silicon, coatings of various organic and inorganic compounds, and electroplated thin films of metals such as tin, gold, and aluminum. AMPTIAC also assists with assessing and sourcing unique materials characterization capabilities and MEMS fabrication services from outside vendors.

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AMPTIAC Conducts Workshops to help DoD Focus Research Efforts in Computational Materials Science and Blast & Penetration Resistant Materials (continued)

AMPTIAC hosted these workshops as part of our mission to increase the utility and impact of Defense-related materials engineering research investments. Special attention was paid to novel computational methodologies and enhanced multi-scale modeling efforts at the CMS workshop, while novel materials and novel combinations of materials and their applications to structural protection from blast and penetration were the focus of the BPRM workshop. Overall feedback from the workshops was very positive, with approximately 30 nationally recognized experts attending each event.

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